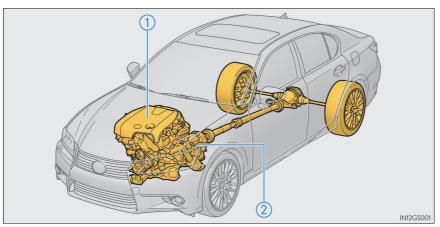
Hybrid system features

Your vehicle is a hybrid vehicle. It has characteristics different from conventional vehicles. Be sure you are closely familiar with the characteristics of your vehicle, and operate with care.

The hybrid system combines the use of a gasoline engine and an electric motor (traction motor) according to driving conditions, improving fuel efficiency and reducing exhaust emissions.

1. Gasoline engine
2. Electric motor (traction motor)

◆ When stopped/during start off

The gasoline engine stops when the vehicle is stopped. During start off, the electric motor (traction motor) drives the vehicle. At slow speeds or when traveling down a gentle slope, the engine is stopped and the electric motor (traction motor) is used.

◆ During normal driving

The gasoline engine is predominantly used. The electric motor (traction motor) charges the hybrid battery (traction battery) as necessary.

◆ When accelerating sharply

When the accelerator pedal is depressed heavily, the power of the hybrid battery (traction battery) is added to that of the gasoline engine via the electric motor (traction motor).

◆ When braking (regenerative braking)

The electric motor (traction motor) charges the hybrid battery (traction battery).

Vehicle proximity notification system

When driving with the gasoline engine stopped, a sound, which changes in accordance with the driving speed, will be played in order to warn people nearby of the vehicle's approach. The sound will stop when the vehicle speed exceeds approximately 15 mph (25 km/h).

■ **Regenerative braking**

In the following situations, kinetic energy is converted to electric energy and deceleration force can be obtained in conjunction with the recharging of the hybrid battery (traction battery).

- The accelerator pedal is released while driving with the shift position in D or S.
- The brake pedal is depressed while driving with the shift position in D or S.

■ **EV indicator**

The EV indicator comes on when driving the vehicle using only the electric motor (traction motor).

■ **Conditions in which the gasoline engine may not stop**

The gasoline engine starts and stops automatically. However, it may not stop automatically in the following conditions:

- During gasoline engine warm-up
- During hybrid battery (traction battery) charging
- When the temperature of the hybrid battery (traction battery) is high or low
- When the heater is switched on

■ **Charging the hybrid battery (traction battery)**

- As the gasoline engine charges the hybrid battery (traction battery), the battery does not need to be charged from an outside source. However, if the vehicle is left parked for a long time the hybrid battery will slowly discharge. For this reason, be sure to drive the vehicle at least once every few months for at least 30 minutes or 10 miles (16 km). If the hybrid battery becomes fully discharged and you are unable to jump-start the vehicle with the 12-volt battery, contact your Lexus dealer.
- If the shift lever is in N, the hybrid battery (traction battery) will not be charged. Always put the shift lever in P when the vehicle is stopped. When driving in heavy traffic, operate the vehicle with the shift lever in D or S to avoid discharging the battery.

■ **Charging the 12-volt battery**

→P. 771

■ **After the 12-volt battery has discharged or has been changed or removed**

The gasoline engine may not stop even if the vehicle is running on the hybrid battery (traction battery). If this continues for a few days, contact your Lexus dealer.

■ **Sounds and vibrations specific to a hybrid vehicle**

There may be no engine sounds or vibration even though the vehicle is able to move. For safety, apply the parking brake and make sure to shift the shift position to P when parked.

The following sounds or vibrations may occur when the hybrid system is operating and are not a malfunction:

- Motor sounds may be heard from the engine compartment.
- Sounds may be heard from the hybrid battery (traction battery) behind the rear seats when the hybrid system starts or stops.
- Sounds from the hybrid system may be heard when the trunk lid is open.
- Sounds may be heard from the hybrid transmission when the hybrid system starts or stops.
- Engine sounds may be heard when accelerating sharply.
- Sounds may be heard due to regenerative braking when the brake pedal is depressed.
- Vibration may be felt when the gasoline engine starts or stops.
- Cooling fan sounds may be heard from the air intake vents on the both sides of the rear seatback.

■ **Vehicle proximity notification system**

In the following cases, the vehicle proximity notification system may be difficult for surrounding people to hear.

- In very noisy areas
- In the wind or the rain

Also, as the vehicle proximity notification system is installed on the front of the vehicle, it may be more difficult to hear from the rear of the vehicle compared to the front.

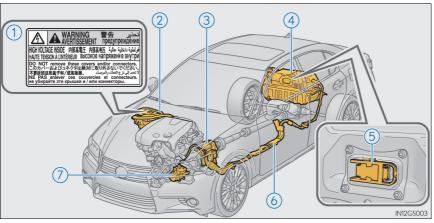
■ **Maintenance, repair, recycling, and disposal**

Contact your Lexus dealer regarding maintenance, repair, recycling and disposal. Do not dispose of the vehicle yourself.

■ **Customization**

Settings (e.g. on/off operation of the EV indicator) can be changed.
(Customizable features →P. 807)

Hybrid system precautions

Take care when handling the hybrid system, as it contains a high voltage system (about 650 V at maximum) as well as parts that become extremely hot when the hybrid system is operating. Obey the caution labels attached to the vehicle.

① Caution label

② Power control unit

③ Electric motor (traction motor)

④ Hybrid battery (traction battery)

⑤ Service plug

⑥ High voltage cables (orange)

⑦ Air conditioning compressor

Hybrid battery (traction battery) air vents

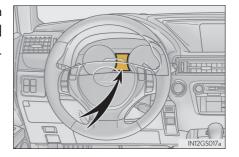
There are air intake vents on the both sides of the rear seatback for the purpose of cooling the hybrid battery (traction battery). If the vents become blocked, the hybrid battery may overheat, leading to a reduction in hybrid battery output.

Emergency shut off system

When a certain level of impact is detected by the impact sensor, the emergency shut off system blocks off the high voltage current and stops the fuel pump to minimize the risk of electrocution and fuel leakage. If the emergency shut off system activates, your vehicle will not restart. To restart the hybrid system, contact your Lexus dealer.

Hybrid warning message

A message is automatically displayed when a malfunction occurs in the hybrid system or an improper operation is attempted.

If a warning message is shown on the multi-information display, read the message and follow the instructions. (→P. 721)

■If a warning light comes on, a warning message is displayed, or the 12-volt battery is disconnected

The hybrid system may not start. In that case, try to start the system again. If the "READY" indicator does not come on, contact your Lexus dealer.

■Running out of fuel

When the vehicle has run out of fuel and the hybrid system cannot be started, refuel the vehicle with at least enough gasoline to make the low fuel level warning light (→P. 714) go off. If there is only a small amount of fuel, the hybrid system may not be able to start. (The minimum amount of fuel to add to make the low fuel level warning light go out is about 2.6 gal. [10.0 L, 2.2 Imp.gal.], when the vehicle is on a level surface. This value may vary when the vehicle is on a slope.)

■Electromagnetic waves

- High voltage parts and cables on the hybrid vehicles incorporate electromagnetic shielding, and therefore emit approximately the same amount of electromagnetic waves as conventional gasoline powered vehicles or home electronic appliances.
- Your vehicle may cause sound interference in some third party-produced radio parts.

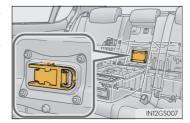
■Hybrid battery (traction battery)

The hybrid battery (traction battery) has a limited service life. The lifespan of the hybrid battery (traction battery) can change in accordance with driving style and driving conditions.

CAUTION

■ **High voltage precautions**

The vehicle has high voltage DC and AC systems as well as a 12-volt system. DC and AC high voltage is very dangerous and can cause severe burns and electric shock that may result in death or serious injury.

- Never touch, disassemble, remove or replace the high voltage parts, cables or their connectors.
- The hybrid system will become hot after starting as the system uses high voltage. Be careful of both the high voltage and the high temperature, and always obey the caution labels attached to the vehicle.
- Never try to open the service plug access hole located behind the rear seats. The service plug is used only when the vehicle is serviced and is subject to high voltage.

■ **Road accident cautions**

Observe the following precautions to reduce the risk of death or serious injury:

- Pull your vehicle off the road, apply the parking brake, shift the shift lever to P, and turn the hybrid system off.
- Do not touch the high voltage parts, cables and connectors.
- If electric wires are exposed inside or outside your vehicle, an electric shock may occur. Never touch exposed electric wires.
- If a fluid leak occurs, do not touch the fluid as it may be strong alkaline electrolyte from the hybrid battery (traction battery). If it comes into contact with your skin or eyes, wash it off immediately with a large amount of water or, if possible, boric acid solution. Seek immediate medical attention.
- If a fire occurs in the hybrid vehicle, leave the vehicle as soon as possible. Never use a fire extinguisher that is not meant for electric fires. Using even a small amount of water may be dangerous.
- If your vehicle needs to be towed, do so with rear wheels raised. If the wheels connected to the electric motor (traction motor) are on the ground when towing, the motor may continue to generate electricity. This may cause an electricity leakage leading to a fire. (→P. 704)
- Carefully inspect the ground under the vehicle. If you find that liquid has leaked onto the ground, the fuel system may have been damaged. Leave the vehicle as soon as possible.

CAUTION

■ **Hybrid battery (traction battery)**

- Your vehicle contains a sealed nickel-metal hydride battery. Never resell, hand over or modify the hybrid battery. To prevent accidents, hybrid batteries that have been removed from a disposed vehicle are collected through Lexus dealer. Do not dispose of the battery yourself.

  Unless the battery is properly collected, the following may occur, resulting in death or serious injury:

  - The hybrid battery may be illegally disposed of or dumped, and it is hazardous to the environment or someone may touch a high voltage part, resulting in an electric shock.
  - The hybrid battery is intended to be used exclusively with your hybrid vehicle. If the hybrid battery is used outside of your vehicle or modified in any way, accidents such as electric shock, heat generation, smoke generation, an explosion and electrolyte leakage may occur.

  When reselling or handing over your vehicle, the possibility of an accident is extremely high because the person receiving the vehicle may not be aware of these dangers.

- If your vehicle is disposed of without the hybrid battery having been removed, there is a danger of serious electric shock if high voltage parts, cables and their connectors are touched. In the event that your vehicle must be disposed of, the hybrid battery must be disposed of by your Lexus dealer or a qualified service shop. If the hybrid battery is not disposed of properly, it may cause electric shock that can result in death or serious injury.

NOTICE

■ **Hybrid battery air vents**

- Do not put foreign objects near the air vents. The hybrid battery (traction battery) may overheat and be damaged.
- Clean the air vents regularly to prevent the hybrid battery (traction battery) from overheating.
- Do not wet or allow foreign substances to enter the air vents as this may cause a short circuit and damage the hybrid battery (traction battery).
- Do not carry large amounts of water such as water cooler bottles in the vehicle. If water spills onto the hybrid battery (traction battery), the battery may be damaged. Have the vehicle inspected by your Lexus dealer.